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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,986	12/19/2001	Jae Yong Park	049128-5052	1161

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EXAMINER

ROY, SIKHA

ART UNIT	PAPER NUMBER
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2879

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/020,986	PARK ET AL.	
	Examiner	Art Unit	
	Sikha Roy	2879	

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address -

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

A request for continued examination under 37 CFR 1.114 was filed in this application after a decision by the Board of Patent Appeals and Interferences, but before the filing of a Notice of Appeal to the Court of Appeals for the Federal Circuit or the commencement of a civil action. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on February 20, 2007 has been entered.

Claims 1, 4-34 are currently pending in the instant application.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1,4-9 and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claim 1, the limitation of ' a protective film formed between the seal cover plate and a stacked multi-layer of the electroluminescent layer, the metal electrode and the heat exhausting layer' does not clearly recite where the protective film is formed and thus renders the claim indefinite. How can a film be situated in between four layers: 1) seal cover plate, 2)

stacked multi-layer of EL layer, 3) metal electrode and 4) heat –exhausting layer. The specification including the drawings does not provide any support to this limitation.

Claims 4-9 and 34 are rejected because of their dependency status from claim 1.

For continuing examination, the Examiner considers the limitation reading as ' a protective film formed between the seal cover plate and the heat-exhausting layer, formed over the metal electrode of a stacked multi-layer of the electroluminescent layer' as shown in Fig.2.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4 – 6, 9 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art (AAPA) in view of U.S. Patent 6,383,048 to Yang et al. and further in view of U.S. Patent 6,195,142 to Gytoku et al.

Referring to claim 1 applicants' admitted prior art discloses (specification page 4 Fig. 1) an electroluminescent device comprising a transparent substrate 1, a plurality of pixel areas including plurality of scanning lines and data lines formed on the substrate, plurality of pixel electrodes 2a formed on the plurality of pixel areas, electroluminescent layer 3 stacked multi-layer comprising 3a,3b and 3c formed over the pixel electrodes, a metal electrode 4 formed on the stacked multi-layer of the electroluminescent layer, a

protective film 5 over the metal electrode, a seal cover plate 7 for sealing the EL layer and a sealant 6 for adhering the seal cover plate 7 to the transparent substrate 1.

AAPA further notes that the EL layer includes a stacked multi-layer.

The applicants' admitted prior art does not disclose the heat-exhausting layer formed on the metal electrode.

Yang in analogous art of organic polymer displays discloses (abstract, column 2 lines 5-10 Fig. 2C) an organic polymer EL display with a heat exhaust (dissipating) layer 28 formed on the metal electrode (cathode). It is to be noted that heat generated during the operation of the display results in disintegration of the organic layers limiting the lifetime of the display. Yang discloses that by using this heat-dissipating layer the heat generated by the EL display can be dissipated and hence the lifetime of the display can be enhanced.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include the heat exhaust layer formed on the metal electrode between the metal electrode and the protective film, as taught by Yang to the electroluminescent display disclosed by applicants' admitted prior art for dissipating heat generated by the EL display and hence enhancing its life.

Referring to claim 1, applicants' admitted prior art and Yang fail to disclose the protective film having multi-layer structure of at least a moisture-absorbing layer and a moisture-proof layer.

Gyotoku in analogous art of organic electroluminescence element discloses (column 4 lines 32-46, column 7 lines 33-36, column 9 lines 1-15 Fig.6) an organic

electroluminescent element having a protective film of laminate film of two layers (7a,7b) or more having an insulating compound GeO, SiO, SiO₂ (known as silica gel which is moisture absorbing) in the lowest layer and a metal film formed on the insulating compound layer. Gytoku discloses that in this configuration of protective film, invasion of moisture (moisture proof) into the cathode or organic thin film is completely shut-off, growth of dark spots on the luminous layer is prevented, thereby presenting an organic electroluminescent element capable of suppressing gradual decline of luminance. Gytoku further notes (column 9 lines 53-57) that this two-layer structure of the protective layer can be formed easily and transitional decline of luminance can be effectively prevented and thus a display device excellent in durability and reliability can be formed.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify the protective film of applicants' admitted prior art and Yang to a protective film of laminate of two or more layers having moisture absorbing and moisture proof layers as taught by Gytoku for easy formation of the protective layer, preventing transitional decline of luminance of the electroluminescent element due to invasion of moisture and thus a display device with excellent durability.

Regarding claims 4-6, applicants' admitted prior art discloses (Fig.1 page 4 [0013]) a moisture absorbing agent 8 formed of fine powder containing any one of BaO, CaCO₃, silica-gel, alumina is provided at the inside of the seal cover plate opposed to the metal electrode to absorb moisture and oxygen from the electroluminescent layer. It is further disclosed (page.4 lines 9-11) a supporting film 9 formed from semi-transmitting

film is used for adhering the moisture absorbing agent to the inner side of the seal cover.

Regarding claim 9, here the applicant is claiming the product of electroluminescent device including a method (i.e. a process) of making the heat-exhaust layer, consequently, claim 9 is considered "product-by-process" claim. In spite of the fact that a product-by-process claim may recite only process limitations, it is the product and not the recited process that is covered by the claim. Further, patentability of a claim to a product does not rest merely on the difference in the method by which the product is made. Rather, is the product itself which must be new and not obvious. As such, no patentable weight has been given to the process recited in claim 9 (see MPEP 2113).

Regarding claim 34, AAPA discloses (Fig.1) the protective film extends to contact the transparent substrate.

Claims 10,11,13-15, 18 and 19-21,25 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art in view of U.S. Patent 6,383,048 to Yang et al.

Regarding claim 10 applicants' admitted prior art discloses all the limitations except a heat-exhausting layer formed on the seal cover plate, wherein the entire surface of the heat-exhausting film contacts the seal cover plate.

Yang in Embodiment 2 discloses (Fig. 3D column 4 lines 31-60) a heat-exhausting layer (covering layer) 40 made of metals of high thermal conductivity is

formed on top of the seal cover film (which covers the electroluminescent element sealing from outside) 38, wherein the entire surface of the heat-exhausting film 40 contacts the seal cover 38 and thus enhances the effect of heat dissipation.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include a heat-exhausting layer entire surface of which contacts the seal cover plate as taught by Yang on the seal cover plate of the EL device of applicants' admitted prior art for enhancing the effect of heat-dissipation from the device.

Regarding claim 11 the applicants' admitted prior art discloses (page 4 line 8 Fig.1) a protective film 5 is formed on the metal electrode 4.

Regarding claims 13-15, applicants' admitted prior art discloses (Fig.1 page 4 [0013]) a moisture absorbing agent 8 formed of fine powder containing any one of BaO, CaCO₃, silica-gel, alumina is provided at the inside of the seal cover plate opposed to the metal electrode to absorb moisture and oxygen from the electroluminescent layer. It is further disclosed (page 4 lines 9-11) a supporting film 9 formed from semi-transmitting film is used for adhering the moisture absorbing agent to the inner side of the seal cover.

Regarding claim 18, here the applicant is claiming the product of electroluminescent device including a method (i.e. a process) of making the heat-exhaust layer, consequently, claim 9 is considered "product-by-process" claim. In spite of the fact that a product-by-process claim may recite only process limitations, it is the product and not the recited process that is covered by the claim. Further, patentability of a claim to a product does not rest merely on the difference in the method by which the

product is made. Rather, is the product itself which must be new and not obvious. As such, no patentable weight has been given to the process recited in claim 9 (see MPEP 2113).

Regarding claim 19 Applicant's admitted prior art discloses all the limitations except for the heat-exhausting layer formed on the protective film wherein the heat-exhausting film extends to contact the transparent substrate.

Yang in embodiment 1 discloses (Fig. 2D, column 3 line 56 through column 4 line 27) a heat-exhausting layer (packaging shell with plurality of grids or metal layers) 29 made of metals of high thermal conductivity is formed on the protective film 29 to enhance the effect of heat dissipation. Figure 2D shows a cross-sectional view of the display along a line that intersects the anode 22, however a plurality of anodes are present (plurality of blocks 22 as anode) and thus at locations between the anodes the heat-exhausting layer 29 covering the display extends to contact the transparent substrate covering the protective layer.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include the heat exhausting layer deposited on the protective film extending to contact the transparent substrate of applicant's admitted prior art as taught by Yang for enhancing the effect of heat-dissipation from the device.

Referring to claim 20 the applicants' admitted prior art discloses (Fig. 1) the seal cover plate provided on the protective film 5 and a sealant for adhering the seal cover plate to the transparent substrate. As the protective film has the heat exhaust layer

formed on the protective film, it would have been obvious to specify the seal cover plate provided on the heat exhaust layer sealing the electroluminescent layer and adhered to the transparent substrate by a sealant.

Regarding claim 21, the heat exhaust layer being formed on the protective film, protects the protective film underneath.

Regarding claim 25, the applicant is claiming the product of electroluminescent device including a method (i.e. a process) of making the heat-exhaust layer, consequently, claim 25 is considered "product-by-process" claim. In spite of the fact that a product-by-process claim may recite only process limitations, it is the product and not the recited process that is covered by the claim. Further, patentability of a claim to a product does not rest merely on the difference in the method by which the product is made. Rather, is the product itself which must be new and not obvious. As such, no patentable weight has been given to the process recited in claim 25 (see MPEP 2113).

Claim 26 - 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art in view of U.S. Patent 5,811,177 to Shi et al.

Claim 26 differs from applicants' admitted prior art in that applicants' admitted prior art does not disclose a metal thin film provided under the seal cover plate, the entire surface of the metal thin film extending to contact the transparent substrate.

Shi in relevant art of electroluminescent organic devices discloses (Fig. 4, column 3 lines 40-63) discloses a metal thin film layer 26 (such as aluminum) under the seal cover plate (epoxy encapsulant) 28, wherein the entire surface of the metal plate

26 contacts the seal plate. The use of aluminum for good heat conduction is well known in the art. Shi further discloses this metal film has low permeability of oxygen and moisture and hence yields overall structure with a better encapsulation and resistance to permeation.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to provide a thin metal film under the seal cover plate of the device of applicants' admitted prior art as taught by Shi et al. for better encapsulation of the device.

The recitation of 'the metal thin film provided under the seal cover plate to transfer heat' has not been given patentable weight because is considered an intended use recitation. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ 2d 1647 (1987).

Regarding claims 27 - 29, applicants' admitted prior art discloses (Fig.1 page 4 [0013]) a moisture absorbing agent 8 formed of fine powder containing any one of BaO, CaCO₃, silica-gel, alumina is provided at the inside of the seal cover plate opposed to the metal electrode to absorb moisture and oxygen from the electroluminescent layer. It is further disclosed (page 4 lines 9-11) a supporting film 9 formed from semi-transmitting film is used for adhering the moisture absorbing agent to the inner side of the seal cover.

Referring to claim 30 Shi discloses the metal thin film adhering the entire surface of the seal cover plate.

Regarding claims 31 and 32 the applicants' admitted prior art and Shi disclose the claimed invention except for the metal thin film adhering to the portion of the seal cover where the moisture-absorbing agent and the sealant are not formed. It would have been an obvious matter of design choice to have the metal thin film adhering to the portion of the seal cover where the moisture-absorbing agent and the sealant are not formed since the applicant has not disclosed that this design of the thin metal film solves any stated problem and it appears that the invention would perform equally well with the thin film covering the entire seal cover plate.

Regarding claim 33 applicants' admitted prior art discloses (page 4 lines 14-17, Fig. 1) the sealant for adhering the seal cover plate and the metal film is epoxy resin which is known in the art to be an ultra-violet hardening (curing) resin.

Claims 12 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art and U.S. Patent 6,383,048 to Yang et al. and further in view of U.S. Patent 6,195,142 to Gytoku et al.

Regarding claims 12 and 22 applicants' admitted prior art and Yang do not exemplify the protective film having single-layer or multi-layer structure of moisture absorbing or moisture-proof layer.

Gyotoku discloses in Fig. 5 the protective layer 7 having a single layer structure having insulating compound layer of GeO, SiO, SiO₂ (known as silica gel which is moisture absorbing).

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include moisture-proof layer as taught by Gyotoku in the protective film of the applicants' admitted prior art and Yang for preventing moisture penetration and oxidation of the electron-injecting electrode and hence enhancement of stable driving period of the organic EL device.

Claims 7,8 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art, U.S. Patent 6,383,048 to Yang et al. and U.S. Patent 6,195,142 to Gyotoku et al. and further in view of U.S. Patent 6,180,176 to Gledhill et al.

Referring to claims 7 and 8 Yang discloses a high thermal conductivity material used for heat exhaust layer but do not disclose the heat exhausting material formed of carbon group material.

Gledhill in pertinent art of providing elastomer surfaces on supporting substrates discloses (column 10 lines 9-18) coating of carbon dag or graphite used for heat absorbent properties.

The selection of known materials for a known purpose is generally considered to be within the skill of the art. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify the heat exhaust layer of Yang formed of

carbon material for its heat-absorbent properties as disclosed by Gledhill because the selection of known material for a known purpose is within the skill the art.

Regarding claim 8 Gledhill discloses (column 5 lines 33-35) graphite film used commercially as heat absorbent coating. The reason for combining art as in claim 7 applies.

Claims 16,17 and 23,24 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art and U.S. Patent 6,383,048 to Yang et al. and further in view of U.S. Patent 6,180,176 to Gledhill et al.

Referring to claims 16 and 17 Yang discloses a high thermal conductivity material used for heat exhaust layer but do not disclose the heat exhausting material formed of carbon group material.

Gledhill in pertinent art of providing elastomer surfaces on supporting substrates discloses (column 10 lines 9-18) coating of carbon dag or graphite used for heat absorbent properties.

The selection of known materials for a known purpose is generally considered to be within the skill of the art. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify the heat exhaust layer of Yang formed of carbon material for its heat-absorbent properties as disclosed by Gledhill because the selection of known material for a known purpose is within the skill the art.

Regarding claim 17 Gledhill discloses (column 5 lines 33-35) graphite film used commercially as heat absorbent coating. The reason for combining art as in claim 7 applies.

Claims 23, 24 recite the same limitations as of claims 16,17 respectively and hence are rejected for the same reasons (see rejection of claims 16,17).

Response to Arguments

Applicant's arguments submitted February 20, 2007 with respect to claim 1 have been considered but are not persuasive.

In response to Applicants' arguments that all of the applied references whether taken individually or in combination do not teach or suggest each and every feature of newly-amended independent claim 1, the Examiner respectfully disagrees. The applicant has not explicitly stated which feature of amended claim 1 is not disclosed by the applied prior arts. Furthermore the Examiner notes that AAPA does teach a multi-layer of the electroluminescent layer (which is very well known in the art)sandwiched between a pixel electrode and a metal electrode and hence the rejection is proper.

Furthermore the Examiner brings to applicant's attention that the rejection of claims 10-33 (as previously rejected) affirmed by the Board of Patent Appeals and Interferences (see Decision on Appeal) on December 19, 2006 are proper and hence the rejection stands.

Art Unit: 2879

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sikha Roy whose telephone number is (571) 272-2463. The examiner can normally be reached on Monday-Friday 8:00 a.m. – 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (571) 272-2457. The fax phone number for the organization is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sikha Roy

Sikha Roy
Patent Examiner
Art Unit 2879